bringing the scanning light beam to a focus on a photoconductive surface using at least two scanning beam focusing mechanisms each of which satisfies an equation:

$\Delta L \cos\alpha > R/2$ at a junction of the scanning light beam with the other scanning light beam on the photoconductive surface,

wherein ΔL represents an inherent light pass length variation, α represents an incident angle, and R represents an inherent marginal distance.

REMARKS

Favorable reconsideration of this application as presently amended and in light of the following discussion is respectfully requested.

Claims 1-18 are pending in the present application. Claims 1, 4 and 7 have been amended by the present amendment.

In the outstanding Office Action, Claims 1-18 were objected to; and Claims 1-18 were rejected under 35 U.S.C. § 112, first paragraph.

Regarding the objection to Claims 1-18, Claims 1, 4 and 7 have been amended in light of the comments noted in the outstanding Office Action and as shown in the marked-up copy. Accordingly, it is respectfully requested this objection be withdrawn.

Regarding the rejection of Claims 1-18 under 35 U.S.C. § 112, first paragraph, the outstanding Office Action indicates that the claimed invention requires that each of the at least two scanning beam focusing mechanisms satisfies the inequality $\Delta L \cos\alpha > R/2$, but that the specification fails to adequately teach how to make the scanning beam focusing mechanisms which satisfy the inequality. In more detail, the outstanding Office Action indicates there are no numerical data, i.e., radius of curvature of each surface of lens/mirror, the refractive index of each lens/mirror, the spacing between optical elements etc. provided

for the scanning focusing mechanisms.

Applicants respectfully submit that the determination of the radius of curvature of each surface of lens/mirror, the refractive index of each lens/mirror etc. is routine and is easily derived to one of ordinary skill in the art with knowing the equation $\Delta L \cos\alpha > R/2$ is to be satisfied. In more detail, Fig. 2 illustrates one example of a telecentric fθ lens system L1 that may be used by the scanning beam focusing mechanisms of the optical scanning apparatus 100 of of Fig. 1. In the telecentric fθ lens system of Fig. 2, light rays of a light beam are directed to a photoconductive surface P in a direction normal to the photoconductive surface P. Therefore, an image focused on the photoconductive surface P remains the same when a passage length of the light rays is changed, for example, by a movement of the photoconductive surface P by a distance V1, as illustrated in Fig. 2 (see page 12, lines 4-13).

Referring to Fig. 3, a wide-angle fθ lens system L2 focuses an image on the photoconductive surface P with a light ray having an incident angle θ which is continuously reduced from 90° as the light rays goes outside the center in the main scanning direction. Therefore, an image focused on a photoconductive surface P is changed when a passage length of the light rays change, for example, by a movement of the photoconductive surface P by a distance of V2, as illustrated in Fig. 3. This causes a change of space between pixels in the sub-scanning direction. The change is continuously increased as the light rays go outside the center in the main scanning direction or as the photoconductive surface P is moved away from the Y-angle lens system L2 (see page 12, lines 14-26).

An optical scanning system includes the inherent marginal distance R and a light pass length variation ΔL which is also inherent to the optical scanning system. Accordingly, an optical scanning apparatus using the optical scanning system has an inherent marginal

distance R and an inherent light pass length variation ΔL. To satisfy required performance, an optical scanning apparatus includes a mechanism for reducing the variations of the light pass length or correcting the displacement at the junction in accordance with the variations of the light pass length, or satisfy an equation $\Delta L \cos\alpha > R/2$, where the light pass length variation ΔL, the incident angle α at the junction, and the marginal distance R (see page 13, line 17 to page 14, line 4). The claimed invention corresponds to satisfying these equations, and Applicants respectfully submit that one skilled in the art would use routine experimentation in determining the appropriate telecentric fθ lens system to achieve this equation.

Accordingly, in light of the above comments, it is respectfully requested this rejection be withdrawn.

Consequently, in light of the above discussion and in view of the present amendment, the present application is believed to be in condition for allowance and an early and favorable action to that effect is respectfully requested.

Respectfully submitted,

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IN THE CLAIMS

1. (Amended) An optical scanning apparatus, comprising:

at least two light sources each configured and arranged to emit a light beam;

at least two beam shaping mechanisms each configured and arranged to shape each light beam;

a light deflector configured and arranged to deflect each light beam in a continuously changing direction thereby converting each light beam into a scanning light beam; and

at least two scanning beam focusing mechanisms each configured to bring the scanning light beam to a focus on a photoconductive surface, each of said at least two scanning beam focusing mechanisms satisfying an equation:

[$\Delta L \cos \theta > R/2$] $\Delta L \cos\alpha \geq R/2$ at a junction of the at least two scanning light beams with each other on the photoconductive surface,

wherein ΔL represents an inherent light pass length variation, α represents an incident angle, and R represents an inherent marginal distance.

4. (Amended) The optical scanning apparatus, comprising:

at least two light source means for emitting a light beam;

at least two beam shaping means each for shaping the light beam;

light deflecting means for deflecting each light beam in a continuously changing

direction thereby converting each light beam into a scanning light beam; and

at least two scanning beam focusing means each for bringing the scanning light beam to a focus on a photoconductive surface, each of said at least two scanning beam focusing means satisfying an equation:

[$\Delta L \cos \alpha < R/2$] $\underline{\Delta L \cos\alpha > R/2}$ at a junction of the at least two scanning light beams with each other on the photoconductive surface,

wherein ΔL represents an inherent light pass length variation, α represents an incident angle, and R represents an inherent marginal distance.

7. (Amended) A method of optical scanning, comprising the steps of:

emitting at least two light beams;

shaping said at least two light beams;

deflecting each of said at least two light beams in a continuously changing direction so as to convert each of said at least two light beams into a scanning light beam; and

bringing the scanning light beam to a focus on a photoconductive surface using at least two scanning beam focusing mechanisms each of which satisfies an equation: [$\Delta L \cos \alpha > R/2$] $\underline{\Delta L \cos\alpha > R/2}$ at a junction of the scanning light beam with the other scanning light beam on the photoconductive surface,

wherein ΔL represents an inherent light pass length variation, α represents an incident angle, and R represents an inherent marginal distance.